

C 3  
C 4  
byte of compressed data to determine slope in the slow scan direction to render the horizontal edge.

8b  
C 4  
15. (Twice Amended) A decompression system for decompressing image data,  
the system comprising:  
a decompressor that decompresses a data bitword-map to provide high spatial  
resolution data containing non-continuous tone data using extra resolution in a direction  
substantially perpendicular to an edge of marks, and that decompresses the data bitword-map  
to provide low spatial resolution continuous tone data.

REMARKS

Claims 1-17 are pending. Applicant appreciates the Office Action indication that claim 7 and 10-12 contain allowable subject matter.

By this Amendment, claims 7 and 10-12 are rewritten into independent form incorporating all the limitations in their respective base claims and any intervening claims, to place claims 7 and 10-12 under condition for allowance. Claim 1 is amended to recite discarding pixels along a direction parallel to an edge while maintaining pixels along a direction perpendicular to the edge, to distinguish from Hsu. Claim 15 is amended to recite using extra resolution in a direction substantially perpendicular to an edge of marks, to distinguish from the combination of Honma and the prior art described in the present application. No new matter is added.

Reconsideration based on the above amendments and following remarks is respectfully requested.

The attached Appendix includes marked-up copies of each rewritten claim (37 C.F.R. §1.121(c)(1)(ii)).

Entry of the amendments is proper under 37 CFR §1.116 since the amendments: (a) place the application in condition for allowance (for the reasons discussed herein); (b) do not

raise any new issue requiring further search and/or consideration (since the amendments amplify issues previously discussed throughout prosecution); and (c) place the application in better form for appeal, should an appeal be necessary. Entry of the amendments is thus respectfully requested.

Applicant thanks Examiner Do for the courtesy extended to Applicant's representative, Gang Luo, during a December 19, 2002 personal interview. The substance of the interview is incorporated in the remarks below.

The Office Action rejects claims 1-6, 8 and 9 under 35 U.S.C. §103(a) over U.S. Patent No. 5,774,634 to Honma et al. in view of U.S. Patent No. 6,389,176 to Hsu et al. This rejection is respectfully traversed.

The Office Action admits that Honma does not disclose or suggest discarding pixels along a direction parallel to an edge. However, the Office Action asserts that Hsu discloses such features. Applicant respectfully submits that Honma and Hsu, individually or in combination, do not disclose or suggest discarding pixels along the direction parallel to an edge while maintaining pixels along the direction perpendicular to the edge, as recited in claim 1.

Hsu discloses extracting objects using dilation and erosion operations. See col. 5, lines 19-20. While the dilation operation adds pixels to the boundaries of edges, the erosion operation removes pixels from the boundaries. See col. 5, lines 20-25. Nowhere does Hsu disclose or suggest discarding pixels along the direction parallel to an edge while maintaining pixels along a direction perpendicular to the edge, as recited in claim 1. Therefore, as discussed during the interview, Hsu does not supply the subject matter lacking in Honma.

For at least the above reasons, Honma and Hsu individually or in combination, do not disclose or suggest the subject matter recited in claim 1, and claims 2-6, 8 and 9 depending

therefrom. Withdrawal of the rejection of claims 1-6, 8 and 9 under 35 U.S.C. §103(a) is respectfully requested.

The Office Action rejects claims 15-17 under 35 U.S.C. §103(a) over Honma in view of the prior art described in the application (APA). This rejection is respectfully traversed.

The Office Action admits that Honma does not disclose or suggest the use of extra resolution across edges of marks to provide the high resolution data containing non-continuous tone data. However, the Office Action asserts that the APA discloses such features. Applicant respectfully submits that Honma and the APA, individually or in combination, do not disclose or suggest using extra resolution in a direction substantially perpendicular to an edge of remarks, as recited in claim 15.

The APA describes that a human viewer appreciates non-continuous tone art information and continuous tone art information differently. Nowhere does the APA describe using extra resolution in a direction substantially perpendicular to an edge of remarks, as recited in claim 15. Therefore, as discussed during the interview, the APA does not supply the subject matter lacking in Honma.

The Office Action asserts that the APA teaches providing high spatial resolution data containing non-continuous tone data using extra resolution across edges of marks in the specification at page 1, lines 13-25. However, this text merely introduces the differences between non-continuous tone art information and continuous tone art information, and the different ways they are viewed by a human viewer. For example, the specification indicates, at page 1, lines 20-22, that this differentiation between the amount of information necessary for the human eye to process non-continuous tone ridges and to process continuous tone ridges is due to hyper-acuity. Further, the specification explains, at page 1, lines 23-25, that hyper-acuity is the human visual system's ability to differentiate low color misaligned edges of marks in a rendered image to a much finer extent than the receptor spacing of the human

eye. Applicant respectfully submits that these text do not disclose or suggest using extra resolution in a direction substantially perpendicular to an edge of remarks.

For at least the above reasons, Honmer and the APA, individually or in combination, do not disclose or suggest the subject matter recited in claim 15 or in claims 16 and 17 depending therefrom. Withdrawal of the rejection of claims 15-17 under 35 U.S.C. §103(a) is respectfully requested.

The Office Action rejects claims 13 and 14 under 35 U.S.C. §102(e) over U.S. Patent No. 6,026,196 to Shannon et al. This rejection is respectfully traversed.

The Office Action asserts that Shannon discloses all elements recited in claim 13. Applicant respectfully submits that Shannon does not disclose or suggest decompressing a single byte of compressed data to produce four pixels of non-continuous tone data, as recited in claim 13.

Shannon discloses a compressed line which has a sync byte 20 followed by image data. See col. 8, lines 63-66. Therefore, the sync byte does not contain the image data.

Shannon discloses splitting image into four strings. See col. 9, lines 16-19. Thus, a final decompressed line of image data is composed of data from the sync byte, then four bytes from each of the four strings. See col. 9, lines 21-26 and Fig. 7. The purpose of the sync byte 20 is to specify how dithered image is synchronized to dither matrix. See col. 10, lines 32-33. Each dither table entry is four pixels wide, thus there can be a dithering displacement of 0-3 indices or 0-3 pixels. See Tables 1-3; col. 10, lines 26-29; and col. 10, lines 36-37. Therefore, as discussed during the interview, Shannon uses 0-3 pixels as a displacement measurement of the width of the dither table entry. Nowhere does Shannon disclose or suggest a sync byte that contains image data. Therefore Shannon does not disclose or suggest decompressing a single byte of compressed data to produce four pixels of non-continuous tone data, as recited in claim 13.

The Office Action asserts that Shannon discloses, at col. 10, lines 30-46, decompressing the sync byte by extracting the four pixels 0-3 therefrom. Applicant respectfully submits that this text does not disclose or suggest extracting four pixels from the sync byte. Particularly, Shannon discloses, at col. 10, lines 43-46, "once the decompressor has extracted the 0-3 pixels from the sync byte, it is ready to decompress and interleave data from S1-S4 to compose a line of dithered uncompressed image data." Applicant respectfully submits that, as discussed during the interview, the first half of this syntax actually means "once the decompressor has extracted the displacement of 0-3 pixels from the sync byte," because, as discussed above, the 0-3 pixels are used as a measuring unit for the width of the dither table entry. Furthermore, the Applicant respectfully submits that the second half of the sentence clearly indicates that the compressed image data is not contained in the sync byte.

In addition, as discussed during the interview, Shannon clearly discloses that the "0-3 pixels" cannot be compressed/decompressed. See col. 10, lines 40-41. Therefore Shannon does not disclose or suggest decompressing a single byte of compressed data to produce four pixels of non-continuous data, as recited in claim 13.

For at least the above reasons, Shannon does not disclose each and every element recited in claim 13. Therefore, Shannon does not disclose or suggest the subject matter recited in claim 13, and claim 14 depending therefrom. Withdrawal of the rejection of claims 13 and 14 under 35 U.S.C. §102(e) is respectfully requested.

In view of the foregoing amendments and remarks, Applicant submits that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1-17 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in better condition for allowance, the Examiner is invited to contact Applicant's undersigned representative at the telephone number set forth below.

Respectfully submitted,



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JAO:GXL/ale

Attachment:  
Appendix

Date: December 30, 2002

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<p>DEPOSIT ACCOUNT USE AUTHORIZATION Please grant any extension necessary for entry; Charge any fee due to our Deposit Account No. 24-0037</p>
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APPENDIX

Changes to Claims:

The following is a marked-up version of the amended claims:

1. (Twice Amended) A method for decompressing image data, that is compressed by discarding pixels along a direction parallel to an edge while maintaining pixels along a direction perpendicular to the edge, representing a plurality of pixels and represented by a plurality of bitwords, each pixel corresponding to a separate bitword, the process comprising:

decompressing data from a compressed-data-bitword to provide data indicative of a plurality of explicit pixels; and

synthesizing data from the data indicative of the plurality of explicit pixels to provide data corresponding to at least one synthesized pixel, the at least one synthesized pixel representing at least one discarded pixel.

7. (Twice Amended) ~~The method of claim 6, wherein,~~ A method for decompressing image data, that is compressed by discarding pixels along a direction parallel to an edge, representing a plurality of pixels and represented by a plurality of bitwords, each pixel corresponding to a separate bitword, the process comprising:

decompressing data from a compressed-data-bitword to provide data indicative of a plurality of explicit pixels; and

synthesizing data from the data indicative of the plurality of explicit pixels to provide data corresponding to at least one synthesized pixel, the at least one synthesized pixel representing at least one discarded pixel,

wherein each of the bitwords are bytes;

wherein decompressing the data from the compressed bitword comprises:

referencing a segmentation bit of the bitword to determine whether the bitword contains non-continuous tone data;

referencing a direction bit to determine whether the direction of the edge located in spaced relationship to a first and a second pixel;

referencing a three-bit value indicative of the first pixel; and

referencing a three-bit value indicative of the second pixel.

10. (Amended) ~~The method of claim 9,~~ A method for decompressing image data, that is compressed by discarding pixels along a direction parallel to an edge, representing a plurality of pixels and represented by a plurality of bitwords, each pixel corresponding to a separate bitword, the process comprising:

\_\_\_\_\_ decompressing data from a compressed-data-bitword to provide data indicative of a plurality of explicit pixels; and

\_\_\_\_\_ synthesizing data from the data indicative of the plurality of explicit pixels to provide data corresponding to at least one synthesized pixel, the at least one synthesized pixel representing at least one discarded pixel;

\_\_\_\_\_ wherein, each of the bitwords are bytes;

\_\_\_\_\_ wherein for each bitword, synthesizing the data is performed in either a fastscan direction or a slowscan direction based on a direction bit contained in that bitword;

\_\_\_\_\_ wherein synthesizing the data comprises:

\_\_\_\_\_ determining which pixel positions are to be synthesized during decompression based on the direction bit;

\_\_\_\_\_ synthesizing the data comprises rendering from each bitword twice as many pixels in a direction perpendicular to an edge indicated by the direction bit of that bitword.

11. (Amended) A method for decompressing image data, that is compressed by discarding pixels along a direction parallel to an edge, representing a plurality of pixels and



represented by a plurality of bitwords, each pixel corresponding to a separate bitword, the process comprising:

decompressing data from a compressed-data-bitword to provide data indicative of a plurality of explicit pixels; and  
synthesizing data from the data indicative of the plurality of explicit pixels to provide data corresponding to at least one synthesized pixel, the at least one synthesized pixel representing at least one discarded pixel;

The method of claim 9; wherein, wherein each of the bitwords are bytes;  
wherein for each bitword, synthesizing the data is performed in either a fastscan direction or a slowscan direction based on a direction bit contained in that bitword;  
wherein synthesizing the data comprises:  
determining which pixel positions are to be synthesized during decompression based on the direction bit;  
when the direction bit indicates a vertical edge, synthesizing the data comprises using the three-bit value associated with the first pixel and the three-bit value associated with the second pixel in the compressed-data-bitword to determine slope in the fast scan direction to render the vertical edge.

12. (Amended) A method for decompressing image data, that is compressed by discarding pixels along a direction parallel to an edge, representing a plurality of pixels and represented by a plurality of bitwords, each pixel corresponding to a separate bitword, the process comprising:

decompressing data from a compressed-data-bitword to provide data indicative of a plurality of explicit pixels; and

\_\_\_\_\_ synthesizing data from the data indicative of the plurality of explicit pixels to provide data corresponding to at least one synthesized pixel, the at least one synthesized pixel representing at least one discarded pixel;

\_\_\_\_\_ ~~The method of claim 9,~~ wherein, each of the bitwords are bytes;

\_\_\_\_\_ wherein for each bitword, synthesizing the data is performed in either a fastscan direction or a slowscan direction based on a direction bit contained in that bitword;

\_\_\_\_\_ wherein synthesizing the data comprises:

\_\_\_\_\_ determining which pixel positions are to be synthesized during decompression based on the direction bit;

\_\_\_\_\_ when the direction bit indicates a horizontal edge, ~~synthesizing the data~~ comprises using the three-bit value associated with the first pixel and the three-bit value associated with the second pixel in the byte of compressed data to determine slope in the slow scan direction to render the horizontal edge.

15. (Twice Amended) A decompression system for decompressing image data, the system comprising:

a decompressor that decompresses a data bitword-map to provide high spatial resolution data containing non-continuous tone data using extra resolution across in a direction substantially perpendicular to an edge edges of marks, and that decompresses the data bitword-map to provide low spatial resolution continuous tone data.